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EXAMINER	
ZHENG, JACKY X	
ART UNIT	**PAPER NUMBER**
2625	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/720,292	CORDERY ET AL.	
	Examiner	Art Unit	
	Jacky X. Zheng	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September 26, 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-12 and 14-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 4-12 and 14-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *November 24, 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/26/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to applicant's amendments and remarks filed on September 26, 2007.

2. **Claims 1, 8-12 and 18-19** have been amended.

3. **Claims 3, 13 and 20-25** have been cancelled.

4. **Claims 1-2, 4-12 and 14-19** are currently pending.

5. The objection to "SPECIFICATION" in Paragraph [0009] is withdrawn in view of Applicant's amendment to the specification.

6. The objections to Claims 8 and 18 are withdrawn in view of Applicant's amendment.

7. The rejections under 35 U.S.C. §112, Second Paragraph, to Claims 1-19 and 21-22 are withdrawn in view of Applicant's amendments and/or cancellation to the claims.

Terminal Disclaimer

8. The terminal disclaimer filed on September 26, 2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of *any parent granted* on *both* Application Numbers of 10/720,664 (corresponding to U.S. Publication No. 2005/0114668) and 10/929,588 (corresponding to U.S. Publication No. 2006/045306), has been reviewed and is accepted. The terminal disclaimer has been recorded.

Information Disclosure Statement

9. The information disclosure statement (IDS) submitted on September 26, 2007 was filed after the mailing date of the application on November 24, 2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. persist

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. **Claims 1 and 10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

12. Claims 1 and 10 are *newly* amended with limitations of "*determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks*" in step (e) of each claim indicated, and Applicant indicated the places in the disclosure for the supports, such as: Paragraphs [0057] of original disclosure as stated in last paragraph on Page 10 of Applicant's "Remarks" filed on September 26, 2007. In consideration of the above-indicated places in the disclosure, Examiner has not found any *explicit* disclosure supporting the limitations of "average brightness levels for said data blocks", *rather*, the supports for "the brightness of the data block" and "calculating average gray scale value of the pixels in the data block" are disclosed in indicated paragraph of [0057]. In details, "average brightness level for said data blocks" and "average gray scale value of the pixels" are obviously referring to two different subjects to one of ordinary skill in the art, whereas first is referring to "average brightness level" with respect to "data block" and later is referring to "average gray scale value" with respect to "the pixel". Further, "data blocks" could

comprise a plurality of pixels, but "data block" and "the pixels" are not equivalent at least in claim scope. Therefore, claims 1 and 10 are rejected for the abovementioned reasons, at least until the further clarification from Applicant indicating that such limitations are indeed being explicitly disclosed in the original disclosure at the time of the application filed or properly amend the claims in supports with original disclosure.

Response to Arguments

13. In re Applicant's remarks from 1st Paragraph to 6th Paragraph on Page 9, with remarks regarding: the objection to the specification, the objections to the claims, non-statutory obviousness-type provisional double patenting rejections, and as well as the rejections made under 35 USC 112, second paragraph, the status of these objections and rejection are previously addressed at beginning of instant office action in views of applicant's filing of Terminal Disclaimer, cancellations and/or amendments to the claims.

(The remaining issues will be address as following)

14. Applicant's arguments filed on September 26, 2007 have been fully considered but they are not persuasive.

15. In re Applicant's remarks from Page 9, 7th Paragraph to Page 11, 1st Paragraph, with regard to Claims 1 and 10, Applicant asserts that "Sharma does not disclose or anticipate step e. of claim 1, as amended, namely *determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks*", and further asserts "Sharma does not disclose or anticipate step e. of claim 10, as amended, namely

determining at least one (i) a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks, and (ii) a correlation between the recovered watermark data and the recovered watermark data and the wave vectors". Applicant's argument(s) are fully considered, however found to be not persuasive for at least the following reasons.

a. First, with regard to claim 1, the limitation of "*determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks*", as also indicated previously in the office action mailed on June 27, 2007, in Sharma et al., i.e. Figure 6, Block "610" illustrates a function block of "Correlation", and Paragraph [0093] discloses the limitation of "performs a correlation between the transformed image block ...."; further, Paragraphs [0188] – [0206], specifically in Paragraph [0188] discloses the usages of orientation vectors and extraction of luminance sample data (or brightness) in correlation process.

b. Second, with regard to claim 10, the limitation of "*determining at least one (i) a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks, and (ii) a correlation between the recovered watermark data and the recovered watermark data and the wave vectors*", as also indicated previously in the office action mailed on June 27, 2007, in addition to the discussion of limitation (i) in claim 1 above, Sharma et al. i.e. Paragraph [0056] discloses "watermarked signal vector"; Paragraph [0188]-[0190] discloses the limitations and usages of "6D orientation vectors" and "4d orientation vectors".

Therefore, for at least the reasons set forth above and the ones set forth in office action mailed on June 27, 2007, the rejection made under 35 U.S.C. §102(e) over Sharma et al. is maintained.

16. In re Applicant's remarks on Page 11, from 2nd Paragraph to 5th Paragraph, with regard to Claims 6-7 and 16-17, Applicant asserts that "Sharma and Murakami, taken separately or together, do not disclose or anticipate step (e) of claim 1 and 10...". Applicant's argument(s) are fully considered, however found to be not persuasive for at least the *identical* reasons set forth above. Thus, for at least the reasons set forth above, the rejection made under 35 U.S.C. §103(a) over Sharma et al. and Murakami with regard to claims 6-7 and 16-17 is maintained.

17. In re Applicant's remarks from Page 11, 6th Paragraph to Page 12, 3rd Paragraph, with regard to Claims 8 and 18, Applicant asserts that "Sharma and Rhoads, taken separately or together, do not disclose or anticipate step (e) of claim 1 and 10...". Applicant's argument(s) are fully considered, however found to be not persuasive for at least the *identical* reasons set forth above. Thus, for at least the reasons set forth above, the rejection made under 35 U.S.C. §103(a) over Sharma et al. and Rhoads et al. with regard to claims 8 and 18 is maintained.

18. Applicant asserts that claims 1-2, 4-12 and 14-19 are allowable because they depend from claims 1 and 10. However, since the rejection of claims 1 and 10 is maintained for reasons stated above, the grounds of rejection for claims 1-2, 4-12 and 14-19 is also maintained since applicant has not pointed to any further deficiencies of the rejection.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

20. **Claims 1-2, 4, 9-13, 14-15 and 19** are rejected under 35 U.S.C. 102(e) as being anticipated by **Sharma et al. (U.S. Pub. No. 2004/0105569)**.

With regard to claim 1, the claim is drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels *(See Sharma et al., i.e. Figure 1, Block 100; paragraph [0053], disclose an representation of the original in form of digitized signal)*; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE *(See Sharma et al., i.e. Figure 6, Blocks 600, 602 & Paragraph [0091], disclose "the detector segments the target image into blocks")*; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data by applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data *(See Sharma et al., i.e. Figure 6, Block 604 & Paragraph [0091] discloses that after segmenting the target image into blocks, and "then performs a 2-dimensional*

fast Fourier Transform (2D FFT) on several blocks"; Paragraphs [0091] discloses performing a 2-dimensional Fast Fourier Transform to the image blocks; Paragraph [0073] also discloses the commonly known transform types, in both spatial or temporal domain); (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data *(See Sharma et al., i.e. Figure 6, Block 606 & Paragraph [0092])*; and (e) determining a correlation between the recovered watermark data for at least some of the data blocks and average brightness levels for said data blocks *(See Sharma et al., i.e. Figure 6, Block 610 & Paragraph [0093], "performs a correlation"; additionally, i.e. Paragraphs [0188]-[0206], discloses the usages of "orientation vectors" and extraction of luminance sample data in correlation process; & Paragraph [0081])*.

With regard to claim 2, the claim is drawn to the method according to claim 1, further comprising: (f) determining that the PIUE is a copy of the original printed image if a strength of a brightness level of the recovered watermark data is negatively correlated with the brightness levels for said data blocks *(See Sharma et al., i.e. Paragraphs [0201], "one figure of merits is the degree of correlation between a known watermark signal attribute and ..." and "another merit is the strength of the watermark signal")*.

With regard to claims 4 and 5, claim 4 is drawn to the method according to claim 1, wherein the watermark detecting operation includes multiplying the transform domain data with a detecting function; and claim 5 is drawn to the method according to claim 4, wherein the detecting function is e^{ikr}, where k and r are phase space indices applicable to the transform domain data *(See Sharma et al., i.e. Paragraph [0056])*.

With regard to claims 9, the claim is drawn to the method according to claim 1, wherein at least one the regions of the PIUE overlap with one or more other regions of the PIUE to which the data blocks correspond are overlapping with each other *(See Sharma et al., i.e. Paragraph [0145]).*

With regard to claims 10-11, 14-15 and 19, the claims are drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the original printed image including a watermark applied to the image using a plurality of wave vectors, the method comprising the *substantially* identical limitations recited in claims 1-5 and 9 *respectively,* and further drawn to using a plurality of wave vectors *(See Sharma et al., i.e. Paragraph [0056] discloses "watermarked signal vector"; Paragraphs [0118]-[0119], disclose "6D and 4D orientation vectors").*

With regard to claim 12, the claim is drawn to the method according to claim 10, further comprising: (f) determining that the PIUE is a copy of the original printed image if a signal level of the recovered watermark data is increases correlated with wavelengths of the wave vectors *(See Sharma et al., i.e. Paragraphs [0201], "one figure of merits is the degree of correlation between a known watermark signal attribute and ..." and "another merit is the strength of the watermark signal").*

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. **Claims 6-7 and 16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-5, 9-15 and 19-22 above, and further in view of **Murakami (U.S. Patent No. 7.065,237)**.

With regard to claims 6-7 and 16-17, the claims further require the limitations of applying "an envelope function" to the transform domain data, and further applying "an inverse transform" to the results of the step mentioned above.

Sharma et al. do not *explicitly* disclose the limitation of applying so-called "envelope function" to the image signal in transform domain, yielding a result and further applying "an inverse transform" to the result.

However, Murakami discloses an invention relates to an image processing apparatus and method for embedding a digital watermark in a digital image and an image processing apparatus and method for extracting the embedded watermark from a digital image. More specifically, discloses the limitation of having "an envelope ring pattern generator" *(See Murakami, i.e. Figure 9, block 902)* for embedding an envelope ring pattern in a Fourier amplitude spectrum on basis of the Fourier amplitude generated by Fourier Transformer *(i.e. Figure 9, block 901);* An "Inverse Fourier Transformer"*(i.e. Figure 9, block 904)* is also disclosed for applying the "inverse Fourier Transform" to the previous results *(For details, column 8, line 47 – column 9, line 60).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitation of applying so-called "envelope function" to the image signal in transform domain, yielding an result and further

applying "an inverse transform" to the result taught by Murakami. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Murakami to include the limitation of applying so-called "envelope function" to the image signal in transform domain, yielding an result and further applying "an inverse transform" to the result taught by Murakami, in order to obtain an image with digital watermark information embedded to be "imperceptible or nearly imperceptible to the human eye..." *(See Murakami, i.e. column 9, lines 36-37).*

23. **Claims 8 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-7, 9-17, 19-22 and 25 above, and further in view of **Rhoads et al. (U.S. Pub. No. 2003/0215112)**.

With regard to claims 8 and 18, the claims are drawn to the method according to claim 1 and claim 10 respectively, wherein the PIUE is part of postal indicia.

Sharma et al. do not *explicitly* disclose the limitation of the original printed image being postal indicia.

However, Rhoads et al. disclose the limitation of the original printed image being postal indicia *(see Rhoads et al., i.e. Paragraph [0118]).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitation of the original printed image being a postal indicia taught by Rhoads et al. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Rhoads et al. to the limitation of the original printed image being a postal indicia taught by Rhoads et al. for *at*

least the reasons of both prior arts of record are related and solving the problems in the identical field of arts, watermarking (or data hiding, data embedding, digital watermarking, steganography).

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. Rhoads et al. (U.S. Pub. No. 2003/0053653) disclose a watermark system includes an embedder, detector and reader.

B. Sharma et al. (U.S. Pub. No. 2003/0026453) disclose an invention relates to digital watermarking.

C. Wendt (U.S. Pub. No. 2002/0126870) discloses a method of block-based watermarking by detecting the location of the watermark.

D. Macy et al. (U.S. Patent No. 6,823,455) disclose a method for robust watermarking of content.

E. Tsai et al. (U.S. Patent No. 6,993,151) disclose a watermark embedding and extracting method and embedding hardware structure used in image compression system.

F. Echizen et al. (U.S. Patent No. 6,728,408) disclose a watermark embedding method and system, specifically detecting the position changes of the pixel in the content.

G. Rhoads et al. (U.S. Patent No. 6,804,379) disclose a digital watermarks and postage.

H. Lee et al. (U.S. Pub. No. 2004/0030899) disclose a method and an apparatus of inserting or detecting digital watermark.

I. Nakamura et al. (U.S. Patent No. 6,185,312) disclose a method and an apparatus for embedding and reading watermarking-information in digital form, also discloses block-based implementation.

J. Yoshiura et al. (U.S. Patent No. 6,711,276) discloses a control method and apparatus for embedding information data.

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

26. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacky X. Zheng whose telephone number is (571) 270-1122. The examiner can *normally* be reached on Monday-Friday, 7:30 a.m.-5p.m., Alt. Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler M. Lamb can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jacky X. Zheng
Patent Examiner
Art Unit: 2625
November 16, 2007

TWYLER LAMB HASKINS
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